

Bauerus dubiaquercus. By Mark D. Engstrom, Thomas E. Lee, and Don E. Wilson

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***Bauerus* Van Gelder, 1959**

Bauerus Van Gelder, 1959:1. Type species *Antrozous* (*Bauerus*) *dubiaquercus* Van Gelder.

CONTEXT AND CONTENT. Order Chiroptera, Suborder Microchiroptera, Family Vespertilionidae, Subfamily Nyctophilinae, Genus *Bauerus*. The genus *Bauerus* includes one extant species, *B. dubiaquercus*. *Bauerus* was described as a subgenus of *Antrozous* (Van Gelder, 1959), but was accorded generic rank by Engstrom and Wilson (1981).

***Bauerus dubiaquercus* (Van Gelder, 1959)**

Van Gelder's Bat

Antrozous (*Bauerus*) *dubiaquercus* Van Gelder, 1959:2. Type locality "María Magdalena Island, Tres Marias Islands, Nayarit, Mexico."

Baeodon meyeri Pine, 1966:308. Type locality "Río Quezalapam, 2 mi E Lago Catemaco, ca. 610 m, Los Tuxtlas," Veracruz, México.

CONTEXT AND CONTENT. Context given in the generic account. *Bauerus dubiaquercus* is considered to be monotypic (Engstrom and Wilson, 1981).

DIAGNOSIS. *Bauerus dubiaquercus* is distinguished from other North American vespertilionid bats by its large ears and dark brown coloration. *B. dubiaquercus* resembles *Antrozous pallidus* (the other North American nyctophyline bat) but is distinguishable externally by its much darker coloration and slightly shorter, narrower ears. Cranially, *B. dubiaquercus* is distinguished from *A. pallidus* by its more pronounced sagittal crest, relatively small auditory bullae, anteriorly inflected upper toothrow, talonid of m3 approximately equal in length to trigonid (talonid approximately half the length of trigonid in *A. pallidus*), and presence of a spicule-like i3 in most specimens whereas *A. pallidus* has two lower incisors on each side (Engstrom and Wilson, 1981; Martin and Schmidly, 1982; Pine et al., 1971; Van Gelder, 1959; White, 1969). The pelvic girdles of *B. dubiaquercus* and *A. pallidus* are similar, but



FIG. 1. Adult female *Bauerus dubiaquercus* from Ojo de Agua, Veracruz, México. Photograph by D. S. Rogers.



FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of female *Bauerus dubiaquercus* from the

Islas Tres Marias, México (USNM no. 512497). Greatest length of skull is 21.1 mm.

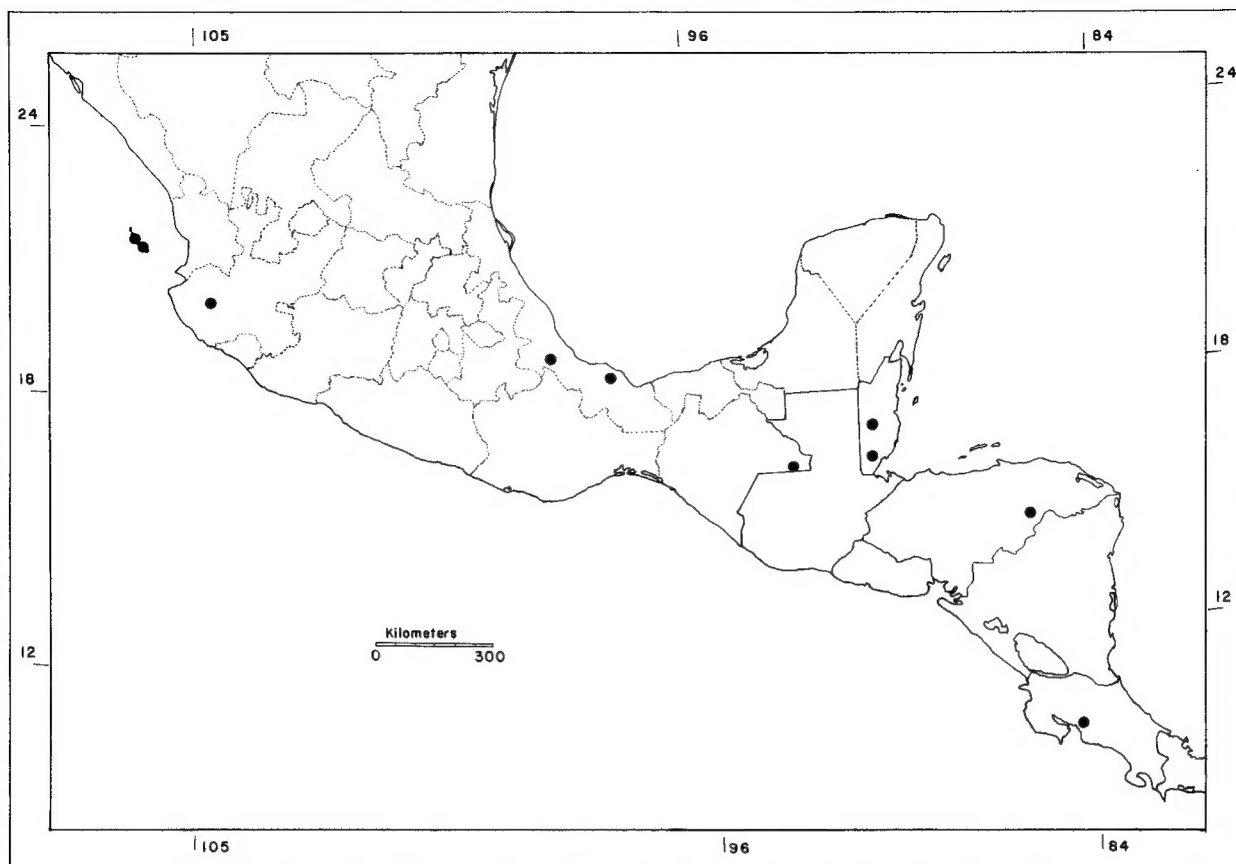


FIG. 3. Distribution of *Bauerus dubiaquercus* in Middle America. Collecting localities indicated by solid circles.

in *B. dubiaquercus* the pubis is comparatively less robust, the ventral tuberosity of the ischium is distinctly pointed (compared to somewhat flattened in *A. pallidus*), and the pubic spine is less pronounced (Martin and Schmidly, 1982). Although structurally similar to that of *A. pallidus*, the penis of *B. dubiaquercus* is much narrower with a less flattened median area (the penis is nearly twice as long as wide in *B. dubiaquercus*, whereas the length and greatest width are approximately equal in *A. pallidus*); the distal tract is somewhat expanded, but distinct distal lobes found in *A. pallidus* are not present; and the penis is distinctly more pubescent. A dorsally exposed urethral canal and dorsally inclined baculum are present in both taxa but the exposed portion of the urethra in *B. dubiaquercus* is less than half the length of that in *A. pallidus* (Martin and Schmidly, 1982; Pine et al., 1971). Chromosomally, *B. dubiaquercus* has a diploid number ($2n$) of 44, whereas $2n = 46$ in *A. pallidus* (Engstrom and Wilson, 1981).

GENERAL CHARACTERS. *Bauerus dubiaquercus* is a medium-sized, dark brown bat with large, prominent ears (Fig. 1). The hair is soft and lax, about 9 mm long dorsally, darker at the base and paler distally. Exposed flight membranes, ears, and rhinarium are dark blackish brown. There is some geographic variation in color; dorsal pelage and exposed membranes usually average darker in specimens from mainland Middle America than in bats from the Islas Tres Marias.

Van Gelder (1959) characterized the skull (Fig. 2) as follows: "Sagittal crest pronounced, continuous, and extended posteriorly as an inion. Rostrum elevated and broad. Auditory bullae very small and narrow, exposing more than half of the overlying cochleae; bullae attenuated anteriorly. Lower incisors crowded. Mandible angled strongly upward posteriorly; angular process projecting almost horizontally." Two or three lower incisors are present. A spicule-like third lower incisor (i_3) was present on at least one mandible in 50 of 52 specimens examined by Engstrom and Wilson (1981), Pine (1967), and Pine et al. (1971). The holotype and one other specimen from the Islas Tres Marias lack an i_3 . The dental formula is $i\ 1/2$ to 3, $c\ 1/1$, $p\ 1/2$, $m\ 3/3$, total 28 to 30.

Engstrom and Wilson (1981) found females of *B. dubiaquercus* to be significantly ($P < 0.05$) larger than males in five of 12 external and cranial measurements. Average and extreme (in parentheses) external and cranial measurements (in mm) for 16 females followed by those for 13 males, all from the Islas Tres Marias, Nayarit, are (Engstrom and Wilson, 1981): length of forearm, 55.2 (50.50 to 57.05), 54.3 (50.55 to 55.80); greatest length of skull, 21.0 (20.55 to 21.50), 20.7 (20.25 to 21.25); zygomatic breadth, 13.1 (12.65 to 13.45), 12.9 (12.50 to 13.20); mastoid breadth, 10.0 (9.75 to 10.35), 9.9 (9.50 to 10.10); length of maxillary toothrow, 7.2 (7.05 to 7.30), 7.1 (6.90 to 7.40); greatest width across upper molars, 8.1 (7.75 to 8.25), 7.9 (7.80 to 8.15). Engstrom and Wilson (1981) noted that specimens from Veracruz were similar in size to those from the Islas Tres Marias, whereas individuals from Jalisco and Honduras were smaller.

Additional measurements and discussions of geographic variation were provided by Engstrom and Wilson (1981) and Pine et al. (1971). The following anatomical illustrations are available: skull and dentition (Fig. 2; Martin and Schmidly, 1982; Van Gelder, 1959); pelvic girdle (Martin and Schmidly, 1982); penis and baculum (Martin and Schmidly, 1982; Pine et al., 1971).

DISTRIBUTION. Most specimens of *B. dubiaquercus* were taken on the Islas Tres Marias, Nayarit, México. Specimens of this rarely encountered bat also are available from scattered localities in mainland Middle America (Fig. 3), including: Costa Rica (Dinerstein, 1985); Honduras (Pine et al., 1971); Belize (McCarthy, in press); and the Mexican states of Chiapas (Medellin L. et al., in press), Veracruz (Engstrom and Wilson, 1981; Pine, 1966), and Jalisco (Engstrom and Wilson, 1981). Elevational range is from approximately 400 to 1,450 m. There is no fossil record for this species.

FORM. The penis of *B. dubiaquercus* is a distinctly pubescent structure nearly twice as long as wide. The distal third is somewhat expanded, dorsoventrally compressed, with a dorsal groove. The baculum is positioned with its long axis tilted upward such that

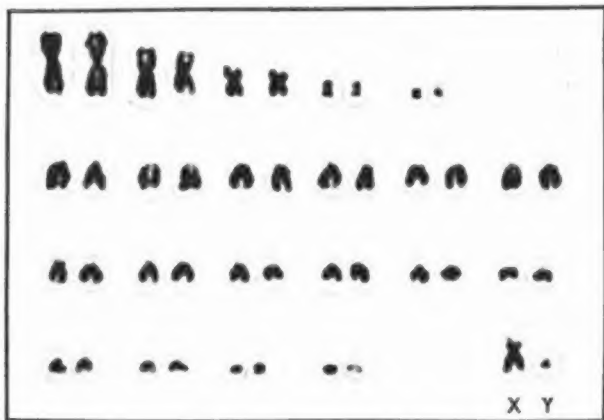


FIG. 4. Karyotype of a male *Bauerus dubiaquercus* from Isla María Madre, Islas Tres Marias, Nayarit, México (Engstrom and Wilson, 1981).

its distal end lies closer to the dorsal surface than the proximal end. The urethra follows the ventral surface of the baculum, then bends to exit dorsally, distal to the baculum. The urethral canal is exposed for about half the length of the expanded, compressed distal third of the penis. A distinct prepuce is absent. *B. dubiaquercus* and *Antrozous pallidus* are the only North American vespertilionid bats in which the distal third of the penis is dorsoventrally compressed with a dorsally inclined baculum and dorsally exposed urethral canal (Martin and Schmidly, 1982; Pine et al., 1971).

ECOLOGY. Few reproductive data are available for *B. dubiaquercus*. In April, a pregnant female with one fetus (22 mm in crown-rump length) and a male with testes 4 mm in length were collected in Honduras (Pine et al., 1971), and a lactating female was taken in Chiapas (Medellin L. et al., in press). In Costa Rica, two "post-lactating" females were collected in July and a male with testes 4 mm in length was collected in June (Dinerstein, 1985).

Specimens of *B. dubiaquercus* have been collected in a variety of tropical forest habitats, including: lowland, premontane, and montane evergreen rainforest; moist, montane pine-oak forest; and lowland tropical deciduous forest (Dinerstein, 1985; Engstrom and Wilson, 1981; McCarthy, in press; Medellin L. et al., in press; Pine, 1966; Pine et al., 1971; Van Gelder, 1959). All specimens have been taken during flight; roosting sites are unknown.

White (1969) related the "bulldog-like" anterio-dorsad upturning of the cheek teeth in *B. dubiaquercus* to feeding strategy and speculated that this species might take food exclusively in flight, using the upturned cheek teeth to obtain a secure hold on large insects. Martin and Schmidly (1982) noted that the pelvic girdle of *B. dubiaquercus* was less robust than that of its nearest relative, *Antrozous pallidus*, and suggested that, unlike the pallid bat, *B. dubiaquercus* probably does not alight on the ground to capture prey.

GENETICS. The karyotype (Fig. 4) has a diploid number of 44 and fundamental number of 52. The autosomal complement comprises two large, one medium-sized, and two small pairs of metacentric chromosomes and a graded series of 16 pairs of medium-sized to small acrocentrics. The X chromosome is a medium-sized submetacentric and the Y is a small acrocentric (Engstrom and Wilson, 1981).

REMARKS. The taxonomic history of *Bauerus* is somewhat complex. Van Gelder (1959) described *Bauerus* as a subgenus of *Antrozous*. White (1969) elevated *Bauerus* to generic rank based

on the presence of a third lower incisor not found in *Antrozous*. Pine et al. (1971) noted that a third lower incisor was not consistently present in *Bauerus* (for example, it is absent in the type specimen) and reallocated the taxon to subgeneric rank within *Antrozous*. Engstrom and Wilson (1981) and Martin and Schmidly (1982) noted pronounced cranial, pelvic, phallic, and chromosomal differences between the two taxa and again regarded *Bauerus* as a distinct genus (the point of view followed in this summary). However, some authors continue to list *Bauerus* as a subgenus of *Antrozous* (for example, Honacki et al., 1982).

Bauerus was named for Harry J. Bauer, the sponsor of the expedition to the Islas Tres Marias on which the bat was first collected. The species name, *dubiaquercus*, was named in honor of the collectors, Richard G. Zweifel and Oakes A. Plimpton and is derived from the latinized combination of Zweifel (German word for doubtful or dubious—*dubia* in Latin) and Oakes (*quercus*).

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